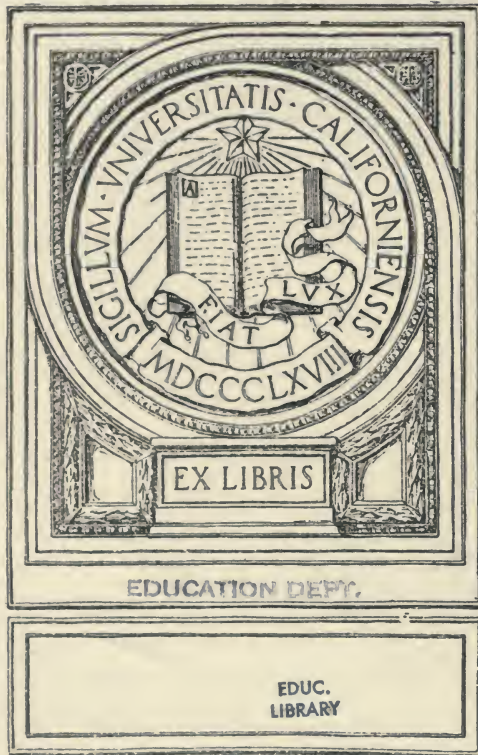


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A large, complex arrangement of small black dots forming a grid-like pattern, likely representing a data visualization or a stylized text representation.

II. THE VOCATIONAL AGRICULTURAL SCHOOL

WITH SPECIAL EMPHASIS ON PART-TIME WORK IN AGRICULTURE

R. W. STIMSON

Agent for Agricultural Education, Board of Education of Massachusetts

DEFINITIONS

Within a year or two noteworthy attempts have been made to define vocational education. Vocational education, in the usage of the state of Massachusetts, includes all forms of specialized education, the controlling purposes of which are to fit for useful occupations. Agricultural education, as a phase of this subject, means that form of vocational education which fits for the occupations connected with the tillage of the soil, the care of domestic animals, forestry, and other wage-earning or productive work on the farm.

The National Society for the Promotion of Industrial Education, at its last annual meeting, adopted the report of a sub-committee which had been directed to give careful consideration to Senate Bill No. 3, now pending in the Senate of the United States, introduced by Senator Page, of Vermont, and to a similar antecedent measure known as the Davis-Dolliver Bill. That committee reported favorably on the general proposition of federal aid for vocational education, including agricultural, and in order that its recommendations might be put in the most constructive form, the committee drafted, by way of suggestion, a measure which seemed to it to incorporate the principles which should prevail in the promotion of vocational education with federal aid. In the measure drafted, sec. 1, under the heading, "Construction," includes the definitions of vocational education and agricultural education above given.

We have, then, something like a general agreement by those who are advocates of vocational education throughout the country, in favor of the definitions above given; and in this particular portion

of the symposium on secondary agricultural education it will be understood that the above definitions are adopted.

It is understood, further, that in this division of the symposium, congressional district schools, county schools, and state schools in undivided districts should be discussed. It has been suggested, moreover, that perhaps the most vital problem in the whole movement at present is the problem of making agricultural instruction really vocational, and that therefore the major portion of this part of the symposium would perhaps better be devoted to discussing ways and means of making agricultural education vocational.

SOURCES OF INFORMATION

A study of legislation upon industrial education in the United States, including agricultural, is now available in *Bulletin No. 12* of the National Society for the Promotion of Industrial Education. The *Report of the Michigan State Commission on Industrial and Agricultural Education*, December, 1910, contains a report of the sub-committee on rural and agricultural education, pp. 18 to 32, in which are discussed the state secondary school of agriculture, the congressional district secondary school of agriculture, and the county school of agriculture, the discussion being based on a careful study of representative institutions of these several types, and supplemented by appendices giving statistics and typical courses of study of these several types of schools. It is understood that this report may be had by members of the National Society for the Study of Education.

Of the congressional district agricultural schools, those of Georgia may, perhaps, be taken as representing an approved type. Two reports of those schools have been published as bulletins of the University of Georgia, and doubtless may be had by members of the Society.

The county schools of agriculture and domestic economy in Wisconsin form the subject of *Bulletin No. 242*, Office of Experiment Stations, United States Department of Agriculture. This bulletin was issued November 9, 1911, and was prepared by Mr. A. A. Johnson, principal of the La Crosse County School of Agriculture and Domestic Economy, and recently appointed superintendent of the new Milwaukee School of Agriculture and Domestic Economy. This bulletin, of course, is available for general distribution. It gives particulars regarding all of the Wisconsin county schools, including statistics,

courses of study, half-tone illustrations, and the Wisconsin law providing for the establishment and maintenance of the schools. It appears to be needless, therefore, to repeat in the brief compass allowed in this paper facts and figures so readily available in the publications above referred to.

The committee in charge of arranging the program of the symposium intended that the discussion of state schools in undivided districts should have reference to such agricultural schools as the three in New York and those in Massachusetts, California, and Minnesota. Though not originally parts of state systems of agricultural schools, they might become such if systems should eventually be established. The United States Department of Agriculture, in its *Circular No. 97* of the Office of Experiment Stations, issued May 23, 1910, gave a complete list of the institutions in the United States giving instruction in agriculture. There is great diversity in equipment and methods among the state schools in undivided districts. An attempt has been made to secure literature, descriptive of these schools, from each. Some personal visits have been paid and information from those who have visited the schools has been sought.

It is announced that the chapter on agricultural education from the annual report of the United States Commissioner of Education for 1911 will be ready for distribution about December 1, with contents as follows: a digest of important legislation in the various states during the past year; a complete summary of the status of instruction in elementary and secondary agriculture in each state; a description of some types of secondary agricultural schools; and a summary of the work of the state agricultural colleges in preparing special teachers of agriculture for secondary schools.

The Yearbook of the United States Department of Agriculture has for a number of years contained reports prepared by Mr. D. J. Crosby, Specialist in Agricultural Education, of progress in the establishment of secondary agricultural schools, their equipment, their work, and their control and support.

CONGRESSIONAL DISTRICT AGRICULTURAL SCHOOLS

On the whole, perhaps we cannot do better than to accept the Georgia schools as good representatives of the congressional district type. The Georgia schools were manifestly intended to be strictly vocational.

The schools are made, by the act providing for their establishment and maintenance, branches of the State College of Agriculture, a department of the University of Georgia, but judging by standards of certain other states, the university has been required by the law rather to adjust itself to these schools than to require the schools to adjust themselves to it.

A very practical course of study is provided, and is made uniform, in general, for all the schools. It is essentially an English, scientific, and practical course. From it all other languages than English are omitted. The report of a committee which suggested foreign languages as optional studies was rejected. The law distinctly states that—

The course of study in state schools shall be confined to the elementary branches of an English education, and practical treatises or lectures on agriculture in all its branches and the mechanic arts, and such other studies as will enable students completing the courses to enter the Freshman class of the State College of Agriculture on certificate of the principal.

The regulations of the schools provide that the school days be so arranged as to assure at least three hours a day of classroom work in agriculture and related sciences, in mathematics and history, and at least three hours a day on the farm or in the laboratory or shop, the hours in actual farm work to be regulated by the exigencies of the farm; the program being such as to provide for the alternation of work and study among the classes morning and afternoon, thereby securing continuous operation of the farm and the shop. Each school was required to have at least 200 acres of land.

It was provided that an account of all receipts from the sale of products of the farm or shop, which were not consumed, should be kept, and one-half of said receipts for each year should be set aside as a fund to pay the students. It was further provided that each pupil, having performed to the satisfaction of the principal, his duties for an entire school year, receive his pro rata of the said fund, the amount going to each pupil not to exceed \$100, and the balance, if any, to be placed in the general fund of the school.

One of the most important sections of the act provides that after the first buildings are erected, before the opening of such schools, which shall be only such as are absolutely necessary for temporary use, all work on, in, and about said schools, or on the farm, or on or in the barns or shops connected

with said schools, whether it be farming, building, care of stock, or work of different kind, shall be performed exclusively by the students of said schools, under such regulations for the proper division and alternations in such work as may be provided by the trustees.

The trustees, in ruling under the above act, have even gone so far in providing for the attendance of older men as to decree that "no one shall be allowed to enter who does not take the required practical work; if only literary work is desired, they should go elsewhere."

The fifth section proposed for the control of these schools suggests the way by which the regulation that work on the farm shall be done by the students may be carried out, viz., that

One-fourth of the students, or such number as the principal may determine as necessary to continue the operation of the farm and shop, be required to remain on the farm during the vacation, and for work required during this time, the students be given fair compensation. Students of the third and fourth year may be given acre plots for individual cultivation, or small farms for supervision, the profits to be their own; the same, however, to be first applied to payment of their dormitory or other expenses.

From the above it will be seen that strong emphasis is laid in the Georgia schools upon productive work actually performed by students, and that the method is that of providing on the school premises sufficient land for enabling this productive work to be done.

The manual labor of the students is divided into two kinds: (1) Instructive labor in practicums in the laboratory, field, shop, and home under the guidance of the instructor for nine hours a week, for which no other compensation is given than the skill acquired or instruction received as in any other school. (2) The uninformative labor for nine hours a week on the farm, in the dormitories, shop, or elsewhere for the primary benefit of the school in its maintenance, and only secondary in its instructive benefit and not necessarily under the instructor. The latter is credited on boarding expenses each month. Each pupil is given fifteen hours a week of classroom instruction, nine hours a week of laboratory, field, shop, and home instruction, or twenty-four hours of instruction and nine additional hours for the support of the school and incidentally of practical benefit to the pupil. Thus thirty-three hours of the pupil's time each week is assigned or a little over five hours a day in head and hand work. It is stated that this gives ample time for study and recreation.

The second annual report of the University of Georgia, November, 1911, p. 29, shows that the income from the farms varied from \$395

in the ninth district to \$3,716 in the first district; the total farm products for the eleven districts being \$22,832. There is every indication, furthermore, that more rather than less emphasis is to be put on the actual productive farming enterprises of the students carried out on the school premises. With a proper correlation of classroom and field instruction, these schools should afford vocational agricultural training of a very high order.

The course of study in the Georgia schools extends over four years. The remark made above, that the law providing for the establishment and maintenance of these schools rather required the university to adjust itself to the schools, than the schools to adjust themselves to the university, is justified by the fact that boys without training in languages, and with only such training as is prescribed for carrying out the regulations above stated, must be admitted to the College of Agriculture. Admission, moreover, must be without examination and on certificate of the principals of the several schools.

COUNTY AGRICULTURAL SCHOOLS

Of county agricultural schools, perhaps we cannot do better than to accept those of Wisconsin as fairly representative. These schools are spoken of both in *Bulletin No. 242*, United States Department of Agriculture, Office of Experiment Stations, and in the *Report of the Commission upon the Plans for the Extension of Industrial and Agricultural Education*, Madison, Wis., 1911, as *trade schools*. The last named report, p. 122, says "these are essentially trade schools and should always be maintained as such." Foreign languages are omitted. Other significant omissions are algebra and geometry.

Bulletin No. 242 gives the following as points in common for all of the schools:

- The county agricultural schools of Wisconsin are co-educational.
- The course of study covers a period of two years—eight months each.
- Each school receives support from the state, amounting to \$4,000 a year.
- All schools require for entrance that students shall have completed work equal to the eighth grade.
- All schools admit students from outside their respective counties.
- Institutes of various kinds are conducted at each of these schools.

Again *Bulletin No. 242* gives the following as some ways in which these schools help the farmers:

- Prepare plans for farm buildings.
- Make suggestions for remodeling old buildings.
- Build forms for and supervise the construction of cement silos, watering troughs, and similar structures.
- Test all kinds of dairy products.
- Assist in the selecting of farm animals.
- Plan drainage systems.
- Test seeds for germination.
- Test cattle for tuberculosis.
- Test soils.
- Recommend systems of rotation.

Half-tone illustrations show classes of students removing stumps with dynamite; raising the form for and constructing a concrete silo; operating the level; pipe fitting; forging; carpentering; road constructing with a road machine and studying various types of gasoline engines. The illustrations show the boys in overalls and evidently acting as participants in the various operations.

Each county school has some land, but repeatedly it is stated that this land is used for experimental and demonstration purposes. No emphasis is laid on the fact that no possible or actual participation is allowed the students in actual productive farm work on the school premises. Moreover, in the list of ways in which these schools help the farmers, the things done appear to be done by members of the staff and not by students in the school. Students evidently use school time for study and for observation, and dependence is placed upon the ability of the students on graduation to apply the instruction they have received in the school for their own benefit.

The Wisconsin Commission upon "Plans for the Extension of Industrial and Agricultural Education" found that the county agricultural schools "serve a class of people the country and high schools fail to reach," that "their value has been clearly and unquestionably demonstrated"; and it recommended that the limit of state aid for each be raised to \$6,000 a year, "but with the provision that if more than \$4,000 be paid by the state that the county shall contribute not less than an equal amount." The original limit for each had been \$4,000 a year from the state.

The trade school, or distinctly vocational character of the instruction given by these schools, was further emphasized by the proposed

relationship of these schools to the university. The Commission recommended that the University of Wisconsin "establish in the College of Agriculture a 'continuation course' for graduates of county agricultural schools." Thus it is seen that the kind of training here considered is sharply differentiated as to field, content, and methods from the ordinary high, or college preparatory school, on one hand, and, on the other hand, from the training for professional service provided in the regular classes of the college of agriculture.

STATE AGRICULTURAL SCHOOLS IN UNDIVIDED DISTRICTS

In elaborateness of land, buildings, equipment, and staff a pretty sharp line can be drawn between two kinds of State Schools in states which have not yet been divided into districts for the development of vocational agricultural schools. These are (1) schools operated in connection with the state colleges of agriculture, and (2) those which are not.

At state agricultural colleges.—Without giving a complete list, it may be well to note here that vocational agricultural schools are now operated in connection with, and upon the premises of, the colleges of agriculture in Minnesota, Montana, Colorado, West Virginia, New Hampshire, and Connecticut.

In such cases the work of the school is primarily practical. It does not differ materially from that of the congressional district, or county agricultural school, in entrance requirements. The courses vary in length from six to nine months a year and from two to four years.

When the demands for vocational agricultural training are sufficiently limited so that a single school may suffice for a state, it would seem to be highly advantageous that the school should be located at the state agricultural college. Duplication of expenditure for land, buildings, and equipment would thus be avoided. The students might be trained in part by assistants, but first or last would become acquainted with, and feel at first hand the influence of, the state leaders in agricultural research and education. In most cases the agricultural college teaching staffs might be expected to adapt their school instruction to the real needs of their school students, as distinguished from their students of college grade. Certainly schools so located have stood high in the estimation of the people. President Northrup once said that there were people in Minnesota—not a

few—in whose minds the School of Agriculture stood for the whole University.

Apart from state agricultural colleges.—In other states, New York and Massachusetts among the number, it has been considered inadvisable to maintain vocational agricultural schools on the premises of, and in immediate connection with, the state colleges of agriculture. In these cases the resources of the schools are more or less limited.

The courses of these schools vary greatly in length and character. Some differ but slightly from the state agricultural colleges of earlier days. Others maintain two-year courses of six or of eight months each, from which have been omitted such subjects as algebra, geometry, and all instruction in languages excepting English. Some utilize a limited amount of land for demonstration and experimental purposes. Others provide for more or less practical farm work on the school farms.

In fact, these schools are proving to be most interesting and valuable experiment stations in methods of vocational agricultural training. Perhaps it is not too much to say that out of the very weakness of some of these schools, in land and equipment, is coming the best strength of the whole movement for a type of agricultural training which shall be genuinely vocational. That is to say, vocational efficiency at the end of a course of training appears to bear no directly proportionate relation to the comparative amounts of money invested in the school plants and their cost of operation; and, similarly, it appears to depend more on points of view and on methods among the various staffs than upon faculty numbers and salary budgets.

Productive work of a high order of efficiency is coming to be considered the real test of all systems of vocational education of secondary grade. Particularly in vocational agricultural education it is coming to be accepted that the training must be such as to develop both skill and managerial ability. The competent farmer must be, not only expert in the varied technique of his calling, but also a sound and progressive business manager.

Neither skill nor business ability can be learned from books alone, nor merely from observation of the work and management of others. Both require active participation during the learning period in productive farming operations of real economic or commercial importance. A masterful, constructive imagination may accomplish much for him who possesses it; and for his needs books and observation may finally

result in vocational efficiency. The difficulty is that such powerful imagination is so rare as to constitute him who has it a genius, far removed from the common run of boys fourteen to eighteen or twenty years of age who live on farms, who expect to follow farming for a living, and whose training is not likely to extend beyond that afforded by the vocational agricultural school.

In general, if there is a defect in the large agricultural schools which boys must leave home in large numbers to attend, and which in order to secure adequate attendance to justify their cost must, apparently, limit their training to six or eight fall and winter months, it is the defect of putting too great reliance upon books and observation, to the exclusion during the intensive learning periods of active participation in the type, or types, of productive farming the boys intend to follow after graduation. Too great, one may almost say in the cases of many of the boys, fatal reliance is put on the ability of the students, once well grounded in sound theory, to put that theory into successful practice on their own farms, alone and unaided.

Even if the large school undertook to put its plant and equipment to the strictest possible productive farming uses of a profitable commercial character, and to induct its students into its aims and to school them in its methods, its efforts would be more than likely to break down through sheer weight of numbers. School farms at present can hardly be claimed to be thoroughgoing commercial farming concerns. The most flattering school photographs, where the aims of the school are most emphatically practical, show by far too few actual participants, by far too many spectators. To see the thing done, however good the demonstration, is not to do it one's self. To participate in the carrying out of an enterprise planned and ordered by another, by even an agricultural school instructor, may leave one little better than a gang-laborer. The pittance paid per hour, where any pay at all is given, can hardly, as an incentive to keen interest and alert action, be considered comparable to the reward the student might hope to realize from an independent enterprise planned and executed by himself and wholly for his own profit or that of his family. It must be feared that, however excellent may be its work in piecemeal demonstrations and in certain really valuable experiments, school farming must from a strictly commercial point of view always remain more or less artificial.

Perhaps the best use to which an agricultural school, large or small, can put its own land and equipment is that of demonstration and experiment. Most schools appear to have adopted this view. It is not clear, however, that any considerable number have adopted methods of training calculated to overcome their defects as agencies for graduating students thoroughly trained in the practice as well as in the theory of profitable farming.

Most of the schools are far from confining their activities to their own premises and regular school classes. What may be done, supplementary to the usual school work, has been admirably set forth by Messrs. D. J. Crosby and B. H. Crocheron in *Separate No. 527*, from the yearbook of the United States Department of Agriculture for 1910, under the title "Community Work in the Rural High School." Suffice it, for our present purpose, to say that these outside efforts are directly planned for the benefit of adults, for persons not in school.

The problem, then, of providing for actual participation, both as manager and as worker, in productive farming, simultaneously with his classroom instruction, on the part of the boy in the agricultural school, may fairly be looked upon as the most startling and stupendous problem in this great field of vocational education. How shall it be solved?

Georgia has attempted its solution, apparently, by requiring the officers and students of the congressional district agricultural schools to create a considerable portion of the equipment and buildings of those schools, and to improve the land and make it commercially productive; also, by proposing a method of reward for competent work, in part by payment per hour for half the labor performed, in part by a plan of profit sharing within fixed limits, and in part by the assignment to each student of an acre or more of land to be cropped for his exclusive benefit. It further proposes to require the attendance of one-fourth of the students through the entire growing and harvesting seasons. The citations from the Georgia law and proposed regulations published by the state authorities made responsible for the work of these schools, given when these schools were before discussed, show plainly the trend of vocational education in that state.

The Massachusetts plan.—Massachusetts has developed another plan for the solution of this problem. This plan was fully set forth in a report submitted to the legislature in January, 1911, by the Massa-

chusetts Board of Education. The legislature has provided state aid for carrying this plan into effect. A vocational agricultural school may be established by any town or city, or by any group of towns or cities which may voluntarily form themselves into a district for this purpose. The state has not been definitely divided into districts by the legislature—congressional district, county, or any other.

Provided an agricultural school, large or small, taught by one teacher or more, with or without school land and live-stock, with training extending over two, three, or four years, a school in general farming or in such specialized production as market gardening—provided an agricultural school is approved by the Massachusetts Board of Education as to “organization, control, location, equipment, courses of study, qualifications of teachers, methods of instruction, conditions of admission and employment of pupils and expenditures of money,” the community or voluntary district maintaining it is entitled to reimbursement from the treasury of the state to the extent of one-half the amount expended in maintaining the school from funds raised by local taxation. The state contributes nothing toward the initial cost of land, buildings, or equipment.

Since the report in which this plan was set forth is not available for distribution, the original edition having been exhausted, it has been suggested that its dominant feature should be given here. That dominant feature has been termed “Part-time Work in Agriculture.”

PART-TIME WORK IN AGRICULTURE

Part-time work in agriculture is the utilization of home land, equipment, and time, outside school hours, for practical training supervised by the school. The term “part-time work” is a descriptive expression, brought over from current discussion of certain forms of industrial training, for use in unfolding the possibilities of this proposed type of training in the field of education in agriculture. Part-time work in industrial education means that the student spends part of the time required for his training in a shop or manufacturing establishment, and part of the time at the school building; both school and shop work, however, being intimately related and supplementary to each other.

Part-time work as applied to agricultural education means that the student must spend part of the time required for his education in productive farm work, preferably at home, and part of his time at the

school; the farm work and school study to be closely correlated by the school at points selected from season to season or from year to year, and to be given the highest possible educational value by competent school supervision.

Equitable.—The same causes that have brought about a widespread demand for co-operation between school and shop in industrial training make just as necessary similar co-operation between the school and the home farm in agricultural training. Historically, shop and farm at one time gave the youth all his vocational training. Of late the tendency has been, under the stress of modern conditions, to throw upon the schools almost the entire responsibility for the industrial and agricultural education of minors. It is becoming increasingly apparent that the school cannot meet this difficult and expensive burden, unaided. It therefore seems to be equitable that the schools shall bestow the related theoretical instruction which they are so well designed to give, leaving to factory and farm the task of giving, under expert direction, the practical experience which they are well equipped to confer.

Economical.—Such part-time work reduces the cost of agricultural training of secondary grade so as to place effective training for the farm within the reach of many communities which would otherwise be unable to secure it. Part-time work obviates the necessity of sending the boy away from home in order to secure the benefits of agricultural training. The cost of living for the boy is less at home than it would be at a boarding school. Parents are deprived of the services of the boy during only a portion of the day.

Effective.—Co-operative work between the school and the home farm is the most effective known means of trying out, under the conditions of individual farms over widely scattered areas, methods which have proved to be profitable elsewhere, as, for example, at a State Agricultural Experiment Station. Such co-operation furnishes the only experimental means by which each boy can try out the merits of the home farm as an agency for producing profits, when treated by the best-known methods; that is to say, part-time work furnishes the only means whereby the principles and methods taught by the school may be positively adapted by the boy to the economic conditions on the farm on which he may spend his working days. Part-time work thus gives to agricultural teaching the reality of actual life, as but little school training can give it.

It is believed, in short, that every purpose of economy in the establishment and maintenance of a system of agricultural schools, and of efficiency in the education provided, will be insured by utilization to the largest possible extent of home land, equipment, and time in the training of boys for the successful pursuit of farming.

In a state system.—Under the “part-time work” plan, developed into a system for a whole state, centers would naturally be selected. The instruction would then be adapted to the kinds of farming prevalent in the districts surrounding those centers. The practical applications of the instruction would thus be subject to the obstacles continually encountered under the economic farming conditions found in any given district; just as they would, also, be aided by all the influences in that commonwealth which make for the improvement of farming. The plan, as an educational process, is believed to possess unquestionable merit, because farming activities readily resolve themselves into what may be termed farming “projects.”

PROJECT METHOD FOR PART-TIME WORK

A farming project is a thing to be done.

1. *Improvement projects.*—The thing done might contribute some element of improvement about the farm, as constructing a concrete walk leading to the front door, the planting and nurturing of shade trees, the making and maintaining of an attractive lawn.

2. *Experimental projects.*—The thing done might be of an experimental nature, as the planting of an untried variety of fruit, the feeding of an untried ration, the testing of an untried spraying mixture, or the testing of one or another of much advertised roofing materials.

3. *Productive projects.*—Finally, the thing done might be of a productive nature, as the growing of a crop of clover or alfalfa, the growing of a field of potatoes, the growing of a crop of silage corn, or the production of eggs for the market.

A farming project is, further, something to be done on a farm, which would involve a limited and definite amount of equipment, materials, and time, and which would be directed toward the accomplishment of a specified and valuable result.

1. *Improvement.*—An improvement project might be limited, for example, to a given length and width of concrete walk, constructed of

a given kind of stone, sand and cement, costing not to exceed a given sum of money, and requiring not to exceed a specified amount of time.

2. *Experimental*.—An experimental project might be limited, for example, to the planting of a given number of trees of an untried fruit, on a piece of ground which could well be spared for such a hazard, and involving a cost in time and money which it was felt could be afforded at a given time for this risk.

3. *Productive*.—A productive project might be limited, for example, to the growing of a given area of clover or alfalfa, at a given cost for seed, fertilizer, and labor, and for the securing of a specified quantity and value of feeding stuff or roughage.

Finally, a farming project, as the term is here used, is a thing to be done on a farm, which, in the preparation for doing it and in the carrying of it out to a successful result, would involve a thoroughgoing educational process.

1. *Improvement*.—The improvement project of constructing a concrete walk to the front door might involve the study of the nature of cement; its action on sand, and gravel or broken stone; its resistant qualities to the weather; the seasons at which it could be used; its cost, as compared with other materials, such as boards, plank, tar, brick, flagging, and asphalt; the mathematical determination of the proportions of cement, sand, and stone to be used; the geometrical determination of the sections into which it should be divided, and whether it should be crowned or flat; the geographical sources of the raw material; and the market conditions for purchasing cement.

2. *Experimental*.—The experimental project of planting an untried variety of fruit might involve the study of the probable adaptability of the variety selected to the soil, the climate, and the market demands within reach of the farm.

3. *Productive*.—The productive project of growing a crop of clover or alfalfa might involve the study of the various varieties of clover; the comparative adaptability of these varieties to the given field on which the crop was to be grown and to the climate of the locality; the most reliable places for the purchase of seed; the best time for seeding; the best time for cutting; the best methods of curing and storing; the mathematical calculation as to the saving in cost of feeding stuffs which the crop would afford; the chemical elements it would furnish

in the ration; and the chemical, biological, and mechanical effects on the soil in which it would be grown.

A complete definition of a "project" as here used has three elements.—Thus, it will be seen that a complete definition of a farming project as here used involves the three elements of (1) something to be done on a farm, (2) under specified conditions and for a specified valuable result, and (3) requiring a thoroughgoing training.

Project fields or classes.—There are certain broad, general fields in which numerous projects might be found. Among these are:

Vegetable gardening.	Greenhouse crops.
Flower gardening.	Production of poultry products.
Landscape gardening.	Beekeeping.
Orcharding.	Swine husbandry.
Small fruit growing.	Sheep raising.
Growing of general farm crops.	Horse raising.
Farm forestry.	Dairying.

Agricultural physics and mechanics as applied to farm buildings, drainage, irrigation, and providing and maintaining farm machinery.

Major projects.—Projects within the above general fields might be major projects. Of major projects, the following may be given as examples:

1. *Caring for the kitchen garden.*—Under the direction of the school, a boy over fourteen years of age might be required to cultivate the kitchen garden for supplying the family with vegetables or small fruit.

2. *Keeping a pen of poultry.*—Under the direction of the school, he might be required to keep a pen of, let us say, twenty-five birds, for the purpose of producing a net profit on the enterprise.

3. *Caring for a selected part of the orchard.*—Under the direction of the school, he might be required to care for a part of the home orchard, say five apple trees, so as to improve the quality of the fruit and thus gain a larger net return.

4. *Raising a specified crop of potatoes.*—Under the direction of the school, he might be required to raise on the home farm an acre, or a tenth of an acre, of potatoes, according to his age and strength, so as to secure the best possible crop and the largest possible financial return.

5. *Caring for one cow.*—Under the direction of the school, he might be required to care for at least one cow in the home herd, with a view

to securing from her the highest production of which she was capable, and to determining whether she were yielding an adequate profit.

Major and minor projects.—While the above does not constitute by any means a complete list of possible major projects, it is intended to be suggestive of the many and diversified kinds of projects that might be feasible for use in the part-time work under consideration. A major project may include a great many minor projects.

Minor projects are related to major projects as parts to the whole.—Minor projects include all the diversified activities which the boy must perform in order to bring the major project which he has undertaken to a successful conclusion.

Details of a project suitable for first- or second-year instruction.—Later in this discussion details are given of a project suitable for use with third- or fourth-year students. The subject in that case is a staple product likely to be grown on every farm, or at least in every farm garden.

At this point it may be desirable that the possible working out of the project method of instruction should be illustrated by details of a subject which would be suitable for use with students of the first or second year.

In the list of major projects above given, the second, "Keeping a Pen of Poultry," will, perhaps, best serve this purpose. This project permits of clear analysis. It is sufficiently familiar to make intelligible such technical terms as it may be necessary to use. It deals with a branch of agricultural production found on every farm and at many village homes; yet a branch from which, when conducted as a separate undertaking and on a strictly business basis, it is very difficult to make a profit. It has to do with farm products which are of very great economic importance for the advancement of agriculture in Massachusetts, at any rate; since this state, while admirably suited for poultry keeping, imports \$25,000,000 of poultry and eggs annually, and produces less than \$6,000,000 worth per year. (See *Agriculture of Massachusetts*, the report of the Secretary of the State Board of Agriculture, 1909, p. 119.)

Owing to the attention now being given poultry keeping by the agricultural colleges and experiment stations, materials for teaching the subject scientifically and practically are increasing, and make this one of the most promising lines of project instruction for school use.

Poultry keeping, moreover, affords one of the best projects for transition from the boy's treatment of animals as pet stock to his treatment of them as vital factors in economic agricultural production.

Important as this poultry project is, however, it will, of course, be understood that there are many other projects suitable for first- and second-year use. This project is but a single example of the many which might have been given.

Minor projects.—Suppose the major project in preparation for purposes of instruction be No. 2, above given, "Keeping a Pen of Poultry." Then certain minor projects necessary for carrying out this major project might be:

1. *The building of a poultry house* (if necessary), according to plans and specifications worked out at the schoolhouse. This minor project in turn could be broken up into a number of subordinate minor projects necessary to its successful completion, such as:

(a) The selection of a site for the poultry house.

(b) The adoption of a plan for the poultry house.

(c) The materials entering into the construction of the poultry house (involving kind, cost, and availability).

2. *The selection of birds*, as determined by the purpose in keeping them (whether for show stock or utility, breeding or egg producing). This minor project in turn might be broken up into a number of subordinate minor projects necessary to its successful completion, such as:

(a) The choice of type and breed.

(b) The choice of breeding stock.

(c) The choice of method of beginning the project.

3. *The feeding of the poultry.*—This minor project might in turn involve a number of subordinate minor projects necessary to its successful completion, such as:

(a) The selection of the kinds of feed.

(b) Working out problems of feeding.

4. *Other minor projects* within the major project of "Keeping a Pen of Poultry," which might also be analyzed into numerous subordinate minor projects, each necessary to the successful performance of the larger minor project and the major project of which it forms a part, are:

(a) The production of eggs for profit.

(b) The production of chicks by incubator.

- (c) The care of chicks by artificial brooding.
- (d) The rearing of chicks.
- (e) The handling of young stock.
- (f) The fattening and killing of poultry.
- (g) The marketing of eggs and birds.

In like manner, every major project similar to those heretofore described, chosen by the school for purposes of instruction, might be analyzed into the minor projects of which it was composed, both in order that the various activities of the boy in the successful accomplishment of the major project might be effectively directed and supervised, and, as we shall see later on, in order that the theories and principles related to the different phases of his task might be given at the time when they would be most effective from the practical and the educational points of view.

Three factors must, it is believed, determine the measure of success in any given plan of part-time work in agriculture: (1) the farmer and his farm; (2) the school and its agricultural supervisor; (3) the boy and his projects.

1. *The farmer and his farm* must constitute the fundamental factor in the practical training of the boy. There can be little effective work in the field of part-time training for the farm without a reasonable spirit of co-operation on the part of the parent. Parents in Massachusetts are required to pledge co-operation.

There are at least three ways in which the parent can aid in making the directed farm experience of the boy most educative: (a) in the use of the home plant; (b) in the use of the home time of the pupil; (c) in giving the boy's projects economic importance.

(a) *In the use of the home plant.*—One of the most essential features of the co-operative part-time plan between home and school is that the parent shall be willing to devote from time to time in accordance with the plans of the supervisor or teacher in charge of the work, a reasonable portion of his buildings, orchards, garden, pasture, forest, and other fields, and of his implements and machines, animals and materials, to the directed training of the boy.

(b) *In the use of the home time of the pupil* the fullest value of the agricultural course comes from the fullest possible participation of the boy in the ordinary routine of farm work as usually carried out by the parent; but the greatest benefit of the school cannot be had without the use

of a part of the boy's time, during the hours spent at home, for strictly school purposes. The following are a few of many illustrations of what might be the directed use of a part of the home time of the pupils in the pursuit of projects suggested and directed by the school:

- A. The boy may help with the milking throughout his course, where the object is to get the cows milked as quickly as possible, and where no records are kept. During certain months of at least one year, the school should require whatever time may be necessary for keeping an accurate record in pounds and ounces of the yield of a part of the herd. This may be limited to the weighing of milk from a single cow, and giving the cow credit for what she produces.
- B. It may be part of the boy's business to assist in feeding the cows. During part of his course, sufficient time should be given for weighing the ration and charging at least one cow with what it costs to keep her.
- C. In the ordinary routine to which he has been accustomed in milking, much or little attention may have been paid to cleanliness of cows, utensils, or the person and clothing of the milker. During part of his time in school, the boy should be given whatever time may be necessary for milking at least one cow and preserving her milk under absolutely sanitary conditions, and for sampling the milk for bacteriological tests.
- D. In the ordinary cropping of the farm, much or little attention may have been paid to leguminous crops. But during one season at least, facilities should be given the pupil for growing a patch of moderate size of clover, and for observing the effect of introducing a large proportion of clover into the ration of the cow.
- E. In the ordinary conduct of the farm, much or little attention may have been paid to the selection and testing of corn for seed. But prior to planting, one season at least, the boy should be given whatever time may be necessary for making germination tests of the corn which it is proposed to plant.
- F. Also, during one season, the boy should be given control of a portion of a cornfield for making an "ear to row" corn test; for observing the difference in yield from different ears of corn—all the corn from one ear being planted in one row and all the corn from another ear being planted in another row.
- G. In the ordinary routine of the farm, it may be the business of the boy to tend the poultry. During at least one year, he should be given control of at least one pen of poultry, and facilities for feeding a balanced ration and trap nesting individual birds for comparison of productivity in laying.

H. It may be part of the usual work of the boy to help cultivate and harvest the potato crop. During one season at least, he should be given facilities for testing the value of the use of formalin for the prevention of potato scab, and of the Bordeaux mixture for protection against potato blight.

(c) *In giving the boy's projects economic importance*, the active aid of the parent would again be almost indispensable.

A. *Keeping accounts*.—Whether or not the parent were in the habit of keeping books, it would be vital to the success of the school training that accurate accounts of outgo and income should be kept with regard to certain home projects directed by the school. Every boy should be taught business-like methods for carrying on work. Modern business methods provide for discovering exactly where money is made, and where it is lost, at any stage or in any part of a given enterprise.

The boy should be given opportunity for testing, under his home conditions, the value of methods which have proved efficacious in business. The school, to be effective, must teach economic production in every phase of farm life for which it gives preparation. Accounting is necessary to any intelligent comparison of the effectiveness of the method advocated by the school with that of a method previously or subsequently followed.

B. *Projects as business enterprises*.—If the experiences of the boy in the farming projects are to be educative to the largest degree, it is believed that they should be conducted strictly as business enterprises. Four methods of meeting the problem of the cost and profit of these directed farming operations would be possible: (a) the parent might meet all the cost, and give the boy all the profit; (b) the parent might meet all the cost, and retain all the profit; (c) the parent might meet all the cost, and share the profit with the boy; (d) the boy might receive the net profit, after the cost of the project had been paid.

From the educational point of view, the last method, by which the boy, after conducting the given project as a business enterprise, would profit only to the extent to which his total receipts exceed the total cost of the enterprise, is believed to be in every way preferable. By this method the boy would learn, once for all, through his own experience, that there can be no product without cost, and no profit without excess of receipts over all expenditures. After such an experience, he would not be likely to undertake a new enterprise without a serious attempt to estimate accurately his probable profit. The boy would be subjected

to the prevailing economic conditions under which the home farm must yield a profit, or a loss, at the end of each year of work.

The method by which a boy becomes on a small scale a farmer or a business man for himself gives the project which he is carrying on a reality not otherwise attainable, that heightens measurably his interest in the work and in the related study of the school, and must fix better than by any other device the training which he is receiving.

Incidentally, it may be remarked that, as a matter of public spirit, the citizens of the community may do much to further the objects of the school by admitting the agricultural instructor or supervisor and his students to their premises, for the examination of animals, machines, and all out-door and in-door operations, and by explanation and discussion of their methods of accounting and their improved farming processes. At another point in this discussion the possible fields of usefulness to a community of such an instructor or supervisor are pointed out.

2. *The school and its supervisor.*—Part-time work in agriculture, whether the school be large or small, requires the services of a trained and experienced agriculturist, who devotes his entire time to teaching the principles and the best methods of farming. It is believed, further, that largely through this instructor or supervisor of agriculture the school should: (a) choose the projects to be undertaken by the boy; (b) direct his work in the discharge of his projects; and (c) put him in possession of the principles that relate to them.

(a) *In the selection of the projects to be undertaken by the boy*, the instructor should take into consideration:

- A. What farming enterprises are profitable, or could be made so, in the neighborhood.
- B. The age of the boy.
- C. The kinds of projects that would be feasible on the home farm.
- D. The boy's routine farm work at home.
- E. The assistance that the father could afford to give in materials and equipment.
- F. The suitability of the project to the season of the year.
- G. The projects and portions of projects that could best be carried out at the school, and the best time on the program of the year for these parts of the work to be done.

The problem of the building of a poultry house by the boy would be one of the possible minor projects, as before shown, when the larger

project of keeping a pen of poultry was under consideration. This problem would naturally involve such questions as these:

- A. Would the student have the necessary time?
- B. Could the necessary materials be provided by the parent or student?
- C. How much personal supervision of the actual work of construction would be necessary or advisable on the part of the supervisor?
- D. Would profitable poultry keeping on a given home farm require the improved accommodations which the model poultry house, built by the student, would furnish?
- E. How far would conformity to the standards set up by the school be necessary in determining what would be a model type of poultry house for a given farm?
- F. In what year of the school course should the building of a poultry house be undertaken, in order that the training in poultry keeping might be made most profitable?
- G. What time of the year could the student build a poultry house to best advantage?

The problem of conducting the building of the poultry house as a strictly business enterprise is a project which would naturally involve these questions:

- A. To what extent, if at all, could the boy be required to meet, or be charged with, all cost save his own labor, and be credited with a fair inventory valuation of the completed structure?
- B. If the parent must advance the money or materials, what rate of interest, if any, should be charged the boy?
- C. What method of accounting should be adopted?
- D. Should such records be kept as would enable the cost of this building to be compared with other similar buildings in the neighborhood, as a check upon the business-like character of the boy's working out of this project?

(b) *In directing the work of the boy in the discharge of his projects*, the school must of necessity, it is believed, undertake the supervision of a portion of his work at home. Supervision of part-time work in agriculture is not an attempt on the part of the school to interfere with the private management of the farms of the parents. Supervision, nevertheless, is a continuous effort by the school to assist, advise, and encourage the students in applying under home conditions, farm methods which have proved successful elsewhere, and thus to cause the practical training of the students to result in vocational efficiency.

The instructor would not undertake to supervise all the details of the farm management on any given farm. Daily supervision would be impossible, because of the number of farms to which the work of the school must be extended. Excessive attention to minute details of farm work on the part of the instructor might create needless friction between himself and the parent, or might interfere materially with the supervision of a proper amount of project work. It is, therefore, not contemplated.

The school should not, it is believed, undertake to shift responsibility for the economic management of a farm from the shoulders of the parent to the shoulders of the public.

The instructor would undertake to supervise certain selected major projects and their related minor projects performed by the boy at home. In a given year and season attention might, for instance, be concentrated upon the project of keeping a pen of poultry. Having given the study related to this project, the instructor would supervise the application of that study. The following examples illustrate what the character of such supervision might be:

- A. In the building of the poultry house, the actual work of putting up the structure might, or might not, be supervised by the instructor. All other elements or phases of the enterprise should be worked out by the student under the direction of the school.
- B. The course in farm shop work of the school might well undertake to deal with the problem of the actual construction of the poultry house.
- C. It would be the duty of the instructor or supervisor to canvass thoroughly with the student the relative merits of different types and methods of poultry keeping, from the points of view before indicated. His supervision might go the extent of passing judgment on any proposed purchase of breeding stock, chicks, or eggs.
- D. The supervisor would not personally direct the daily routine work of feeding and watering poultry. His duties would consist of directing the thorough study of possible feeds and mixtures, their comparative cost and availability, and their suitability to the age, condition, and purpose of the student's particular birds. For such supervision personal knowledge by the instructor of the exact home conditions would be necessary.

The supervision of the practical home work of the boy or girl would naturally follow the settlement of such problems as these:

- A. How could supervision and instruction be closely correlated?
- B. How should the time of the instructor and of the pupil be apportioned between home and school duties.

- C. What would be the maximum radius, from the school building as a center, of effective supervision?
- D. What methods might be employed for securing and holding the co-operation of the parent and the community?
- E. By what means might satisfactory standards in the practical work of the student be maintained?

Thus far we have discussed the duties and responsibilities of the special instructor or supervisor of agriculture *in the field of direction* of the boy's projects on the home farm.

The instructor might undertake to give help to others than those connected with his school. There are not wanting those who believe that such an agricultural instructor attached to a regular high school might render valuable service to the community in which he was employed, in what might be termed *the field of suggestion*. Considering the previous training and experience required of this instructor, he should be a man well prepared to be of wide assistance in a farming community as an adviser in emergencies which called for special knowledge and skill. If met by a problem with which he could not cope unaided—and there might be many such problems—he would know the best men, books, and bulletins, or where to find them, for consultation in such emergencies. Such problems might arise from attacks upon crops by injurious insects or by fungous diseases.

The friendly advice which the agricultural instructor might give need not mean a meddlesome attitude on his part. His suggestions would not be given save when requested, or when it was evident that they would be welcome.

The field of suggestion would naturally begin with farms represented in the school by students. The instructor would of course stand ready to give the parents any advice of which he might be capable, or to get for them, or instruct them how to get, any information which they might need or desire. With the gradual extension of his knowledge to the other farms of the community, he might be expected to stand ready in a similar manner to be of assistance to the owners of those farms. Such service, however, would be incidental. His main work would be with the boys enrolled in his classes.

3. *The boy and his projects* form a natural connecting link between the farmer and his farm, on one hand, and the school and its instructor, on the other. At the farm, the pupil deals with the practical aspects of

his projects; and at the school, with their scientific aspects. The foregoing discussion has been devoted chiefly to the practical aspects of the proposed project method of instruction. The present section lays strongest emphasis on the related study essential for the successful carrying out of a particular project.

Details of a project suitable for third- or fourth-year instruction.—Earlier in this paper a project was dealt with which might, for the most part, be successfully carried out by a first- or second-year student. For the present discussion a project has been selected which would require considerable maturity of age, strength, and training for its successful accomplishment. It is true that simpler problems in potato growing have been successfully carried out by elementary school pupils; but even a glance over the elements which enter into the project now to be outlined will show that problems altogether too serious to be comprehended or undertaken by the younger pupil are here involved.

It is to be understood, of course, that the following project is but one of many which might be selected.

(a) *Major project.*—It is assumed that the boy has chosen for his major project the development of a method for increasing the profit from the potato crop customarily grown on the home farm. It is further assumed that 5 acres of potatoes are generally grown; that this year the crop is to be grown on clover sod; that the variety of potatoes to be grown has been chosen by the father; and that the boy's father is willing that his boy shall have complete control of a given number of rows of the 5-acre field, and shall be furnished the necessary tools and materials for his project.

(b) *Minor projects* necessary for carrying out the above major project might then be as follows:

A. *Insuring the most abundant crop by:*

1. *A proper seed bed.*—The related study here would involve knowledge of:

- (a) Conditions of soil, air, texture, temperature, and moisture most favorable to the growth of the potato plant, including methods of reducing an undesirable amount of "free" water, of avoiding too great dilution of plant food, and of securing a desirable amount of "film" water.
- (b) Methods of preparing the seed bed, including the comparative advantages of fall and spring plowing, and the best treatment of the land in the spring after plowing and prior to planting.

2. *Proper fertilizing.*—The related study here would include knowledge of:
 - (a) Chemical composition of the potato plant, its osmotic and digestive processes, and the quantity of available fertilizing materials it is capable of assimilating.
 - (b) Complete fertilizers for the production of potatoes, including analyses of standard fertilizers, and the plant-food values for potato growing of chemicals and mixtures offered for purchase.
 - (c) Comparative desirability of muriate and sulphate of potash for producing a crop to be disposed of in an immature state as new potatoes, or for producing a crop of late potatoes to be disposed of for winter use; and the extent to which the "mealy" character of the mature crop should be the determining factor in choosing between these two kinds of potash.
 - (d) Clover sod as a factor in determining the proportion of nitrogen to be supplied.
 - (e) Best formula for a complete fertilizer for this particular crop, taking into account the potato plant, the previous crops and their fertilizer treatment in the system of crop rotation followed on the home farm, the present soil conditions, and the purpose of the crop.
 - (f) Most liberal amount of fertilizer warranted for use in growing this particular crop, in view of the known condition of the land and the assimilative powers of the potato plant; and the saving in cost by home mixing of the supply to be used.
3. *Using the best seed.*—The related study here would include knowledge of:
 - (a) Botanical characteristics of the potato plant; the difference between a seed and a tuber; and potato improvement by various methods and conditions of propagation, taking into account tendencies of the potato plant to "variation" and to "mixing in the hill."
 - (b) Importance of planting "seed" selected in the field from the best-yielding hills, rather than seed selected from the bin merely by size of tubers.
 - (c) Advantage of using potatoes for planting which have been properly stored, and the effects of freezing and sprouting in the cellar.
 - (d) Conditions under which it may be desirable to sprout potatoes to be used for planting, in a warm, well-lighted room—the temperature, the time, and the care in handling required for such sprouting.
 - (e) Size of piece and number of eyes to the piece, as important factors in starting the crop and in the quantity of its yield.
4. *Proper planting.*—The related study here would include knowledge of:—
 - (a) Botanical and chemical characteristics of the potato plant, as to

its feeding habits, the growth of the tubers, and the effect on the tubers as food products of exposure to the sun during their growth.

- (b) Distances between rows, and between seed pieces in the row.
 - (c) Depth of planting, in its relation to protection of the tubers from the sun, shielding the crop from possible rot-producing bacteria and spores, and subsequent cultivation, whether by the "level" or by the "hill" method.
 - (d) Best time for planting, whether for "early" or for "late" potatoes.
5. *Proper spraying*.—The related study here would include knowledge of:
- (a) Botanical characteristics of the potato plant, particularly the relation of health and luxuriance of foliage to tuber production.
 - (b) Insect enemies of the potato plant, and their entomological characteristics, such as their methods of propagation and their feeding habits.
 - (c) Depredations of insects, and their possible relation to attacks upon the potato plant by plant diseases.
 - (d) Paris green: its chemical composition; its protective action against the insect enemies of the potato plant; dangers attendant upon its use; its possible combination with Bordeaux mixture; and the best formula, method of preparation, and periods for its application.
6. *Proper cultivation*.—The related study here would include knowledge of:
- (a) Physical characteristics of the soil, particularly the capillary movement of water to the surface of the soil, and exhaustion of soil moisture by evaporation.
 - (b) Surface conditions most favorable for receiving rain water without washing, puddling, or subsequent baking.
 - (c) Value of a "soil mulch," and the most desirable method and frequency of cultivation for maintaining such a mulch.
 - (d) Comparative cost and advantages of "level" and "hill" cultivation, and reasons for the choice of the particular method to be followed in cultivating the present crop.

B. Insuring the cleanest crop by:

1. *Dipping the "seed" potatoes* in a formalin solution. The related study here would involve knowledge of:
- (a) Plant parasites which produce "scabby" potatoes, and the biological conditions favorable and antagonistic to their growth.
 - (b) Formalin solution: its chemical constitution; its chemical action on these damaging potato parasites; and the proper formula and method for its use in protecting the potato crop.

2. *Substitution of chemical fertilizers* for barnyard manure. The related study here would involve knowledge of:
 - (a) Dangers of infection from the use of barnyard manure.
 - (b) Dangers of infection, if any, from the use of chemical fertilizers.
- C. *Insuring the soundest crop by spraying* the potato plants with Bordeaux mixture. The related study here would involve knowledge of:
 - (a) Bacterial and fungus diseases to which the potato plant is subject; evidences of their presence; and whether or not they are preventable.
 - (b) Bordeaux mixture: its chemical composition; its protective action against potato-plant diseases; and the best formula, method of preparation, and periods of application for its use.
- D. *Other minor projects* would include the most profitable means and methods of harvesting, storing, and marketing the crop. And other studies related to these projects would include knowledge of potato implements and machines and their use; the comparative advantages of field pit and cellar for storage; principles and means of ventilation, and the temperature at which potatoes should be kept; near and more distant markets, and comparative transportation cost; prices and the probable tendency of prices, in view of the press and government reports of the potato crop for the state, the country, and the world.

General observations on related study.—The study related to the work of carrying out this potato project embraces, therefore, important matter from several sciences, including botany, chemistry, physics, entomology, bacteriology, and plant pathology. For the calculations, mathematics would be necessary; for keeping the accounts, bookkeeping would be required; for correct correspondence, there should be training in business English; consideration of transportation, markets, and world-production would involve knowledge of commercial and agricultural geography.

The project method of instruction on the side of related study, thus, it will be evident, must insure that the boy, in carrying out his projects, shall pass through a thoroughgoing educational process.

Good citizenship.—It is proposed, furthermore, that the division of time, in carrying out the school and home farm co-operative method of training, shall be about as follows: for the execution of the projects, including work during vacations and other out-of-school hours, 50 per cent; and for the related study, 30 per cent. The remaining 20 per cent of the time of the boy is expected to be used for general culture and good citizenship instruction, wherein systematic courses may be

provided in such subjects as English, history, civics, current events, mathematics, and science.

AGRICULTURAL INSTRUCTOR AND HOME WORK SUPERVISION

In order to carry out the project method in agricultural part-time work, it has been shown that it is necessary to employ at least one instructor throughout the summer for supervision of the home-farm enterprises of the pupils. And it is evident that such an instructor must possess special qualifications for this work, in preparation, experience, and personality.

He should be a graduate of an agricultural college.—His preparation should include graduation from an agricultural college or its equivalent. He should be familiar with and keep in touch with the officers and the work of the agricultural college and experiment station of the state in which he serves and he should keep in touch with the experiment stations in other states where work is being done under conditions similar to those in his state.

He should be familiar with the work of the United States Department of Agriculture, so far as it is applicable to his state. He should be capable of keeping in touch with new literature in pamphlet, periodical, and book form, as it is issued, and to the extent that it may be applicable to his locality. He should be familiar with the work of organizations concerned with rural progress in his state, and capable of heartily co-operating with their officers.

His experience.—Preferably, such a person undertaking to prepare for agricultural teaching, in Massachusetts for example, should have been reared on a Massachusetts farm, or on a farm where the agricultural operations would yield experience of value for work in this state. He must be a master of farming as a handicraft and amply able to demonstrate the things which he undertakes to teach; and he should be familiar with, and be able to demonstrate the use of, the kinds of farm machinery which can be economically used on farms of his locality.

His personality.—Since he must teach, such an instructor or supervisor must be effective in discipline; that is to say, in the handling of boys. He must be prepared to meet people in his community pleasantly, and establish agreeable working relations with them. He must be prepared to maintain harmonious relations with his fellow-teachers,

and be amenable to the authority of the officers responsible for the school which he serves.

His school year should provide for service during the spring, summer, and fall months, giving him a vacation during the winter months; rather than for service during the fall, winter, and spring, with summer months for vacation purposes. Such a program would insure his services throughout the growing and harvesting seasons; and, by allowing him time for proper professional improvement through winter study at the state agricultural college, and through further observation and experience on intensive commercial plants, such as those devoted to poultry, certified milk, and greenhouse and hot-bed production of vegetables, cut flowers, and foliage plants, should make him permanently and increasingly useful.

His absence during winter months would not seriously disturb the curriculum of the school; on the contrary, it would make room for the teaching of related subjects, including manual-training projects related to the farm, by other members of the staff to the lower classes; it might also enable the higher classes to take winter short courses at the agricultural college, and thus make them acquainted with men engaged in research and experimental work.

The salary of such a supervisor is an important consideration. Experience seems to show that, in order to command the services of a man having the technical training, practical experience and personality called for in the above discussion of the necessary qualifications of a successful supervisor, salaries ranging from \$1,200 upward must be paid. One such instructor in Massachusetts was started at \$1,500 and will be advanced \$100 a year to \$2,000, if his work continues to give satisfaction.

The problem of necessary salaries is an economic one at bottom.—In order to attract to the work a supervisor of the type herein described, it will be necessary to make the compensation which he is to receive as good as, or better than, that which is offered to him in competing lines of work.

CONCLUSION

It is believed that home farm work, supervised by the school, where conditions are at all like those in Massachusetts, might well be substituted as far as possible for the present methods of much work, little work, or no work at all of a *productive and managerial* nature, now

found in connection with vocational agricultural school training; and that the project method of bringing agricultural science immediately to bear on actual farm practice, in going commercial agricultural enterprises conducted by the boys themselves, is a promising solution of our most pressing problem in this field of vocational training.

The Smith's Agricultural School at Northampton, Massachusetts, beginning with the school year 1908-9, has employed a man for the express purpose of assisting the boys throughout the summer in applying the teachings of the school in their home farm work. This method immediately appeals to the motor instincts and activities of boys of secondary school age. The success of boys in the corn-growing clubs in many states shows that boys instantly respond to help at home.

A school boy of sixteen at the recent Massachusetts Corn Show won the sweepstakes against all comers, including the sweepstakes winner of last year at the big New England Corn Show, for the best single ear of corn and also for the best collection of ten ears. He had been given seed by the former winner, and had been told and shown out of school hours what to do, and when and how to do it on his father's land. Most boys, like most men, learn best by being told and shown on the field of action.

This method offers the boy, all too eager to quit school for work on reaching his fourteenth birthday, a strong incentive to continue in school; because it bids fair to make him *an earner while still a learner*. Boys like to feel that as members of the family they are at last able to pay their own way.

In short, it is believed that the vocational education for farming outlined in the above discussion, and embodying the project and part-time work method, will justify itself from every reasonable point of view, and that the school, or system of schools which adopts it and works it out patiently and persistently will find that it possesses undeniable merit as a method of training not only for farming as a definite calling, but also for intelligent and vigorous participation in the community life of any commonwealth.



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